



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
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December 17, 2019

To: Interested Parties

From: Scott Voss, Supervisory Fish Biologist, Red Bluff Fish and Wildlife Office

Subject: Biweekly report (December 3, 2019 - December 16, 2019)

Please find attached preliminary daily estimates of passage, 90% confidence intervals, and fork length ranges of unmarked juvenile salmonids sampled at Red Bluff Diversion Dam for the period December 3, 2019 through December 16, 2019. Race designation was assigned using length-at-date criteria.

This report also contains graphical displays of salmonid passage dating back to 2012 for comparison.

Please note that data contained in these reports is subject to revision as this data is preliminary and undergoing QA/QC procedures.

If you have any questions, please feel free to contact me at (530) 527-3043 ext 243.

Table 1.— Preliminary estimates of passage by brood-year (BY) and run for unmarked juvenile Chinook salmon and steelhead trout captured by rotary-screw traps at Red Bluff Diversion Dam (RK391), Sacramento River, CA, for the dates listed below. Results include estimated passage, peak river discharge volume, water temperature, turbidity, and fork length (mm) range in parentheses. A dash (-) indicates that sampling was not conducted on that date.

Date	Discharge volume (cfs) <sup>1</sup>	Water temperature (°C)	Water turbidity (NTU)	Estimated passage				
				BY19 Winter	BY19 Spring	BY19 Fall	BY19 Late-Fall	BY19 RBT
12/3/2019	6,862	10.6		47,325 (46 – 88)	2,090 (34 – 45)	752 (31 – 33)	1,494 (95 – 151)	0 (–)
12/4/2019	6,802	10.9	2.6	6,149 (47 – 91)	555 (35 – 46)	898 (30 – 34)	171 (93 – 113)	0 (–)
12/5/2019	6,702	11.2	2.3	1,684 (47 – 91)	662 (35 – 46)	2,186 (30 – 34)	33 (116)	0 (–)
12/6/2019	6,722	11.4	2.3	849 (48 – 82)	493 (35 – 37)	686 (30 – 34)	195 (123 – 159)	0 (–)
12/7/2019	7,251	11.7	2.1	–	–	–	–	–
12/8/2019	26,562	11.7	109.8	2,908 (57 – 75)	0 (–)	0 (–)	0 (–)	0 (–)
12/9/2019	13,286	11.0	47.7	41,630 (48 – 90)	9,250 (36 – 47)	68,947 (29 – 175)	2,934 (100 – 171)	688 (104 – 178)
12/10/2019	8,536	10.4	21.2	11,052 (48 – 95)	4,281 (36 – 47)	13,677 (29 – 35)	677 (125 – 140)	263 (123 – 164)
12/11/2019	7,377	10.6	7.7	3,066 (49 – 97)	564 (36 – 48)	6,179 (28 – 35)	46 (160)	83 (85 – 86)
12/12/2019	8,247	10.9	7.4	1,006 (49 – 91)	53 (37)	2,855 (31 – 36)	51 (122)	0 (–)
12/13/2019	10,958	11.2	20.8	2,082 (54 – 86)	169 (37)	7,749 (31 – 36)	0 (–)	0 (–)
12/14/2019	10,486	11.0	11.3	1,064 (52 – 91)	220 (37 – 49)	2,863 (29 – 36)	46 (126)	44 (83)
12/15/2019	9,456	10.1	6.4	2,062 (50 – 93)	264 (37 – 42)	3,634 (30 – 36)	187 (104 – 137)	0 (–)
12/16/2019	7,963	9.3	5.1	1,975 (55 – 98)	32 (48)	6,296 (29 – 37)	292 (101 – 136)	128 (90 – 190)
<b>Biweekly Total <sup>2</sup></b>				<b>139,610</b>	<b>20,808</b>	<b>128,967</b>	<b>6,931</b>	<b>1,321</b>
<i>Biweekly Lower 90% Confidence Interval</i>				60,166	4,619	15,257	1,740	-152
<i>Biweekly Upper 90% Confidence Interval</i>				219,053	36,997	242,677	12,121	2,793
<b>Brood Year Total</b>				<b>3,932,808</b>	<b>257,777</b>	<b>130,347</b>	<b>153,832</b>	<b>24,910</b>
<i>Brood year Lower 90% Confidence Interval</i>				2,573,081	155,647	14,458	28,798	7,577
<i>Brood year Upper 90% Confidence Interval</i>				5,292,535	359,908	246,236	278,862	42,242

<sup>1</sup> Peak daily discharge values do not account for diversions at RBDD and only represent peak flows registered at the Bend Bridge Gauging station (<http://cdec2.water.ca.gov/cgi-progs/queryFx?bnd>).

<sup>2</sup> Biweekly totals may be greater than the sum of the daily estimates presented in this table if sampling was not conducted on each day of the biweekly period. A dash (-) denotes those dates. To estimate daily passage for days that were not sampled, we impute missed sample days with the weekly mean value of days sampled within the week.

## Juvenile Winter Chinook Salmon Estimated Passage

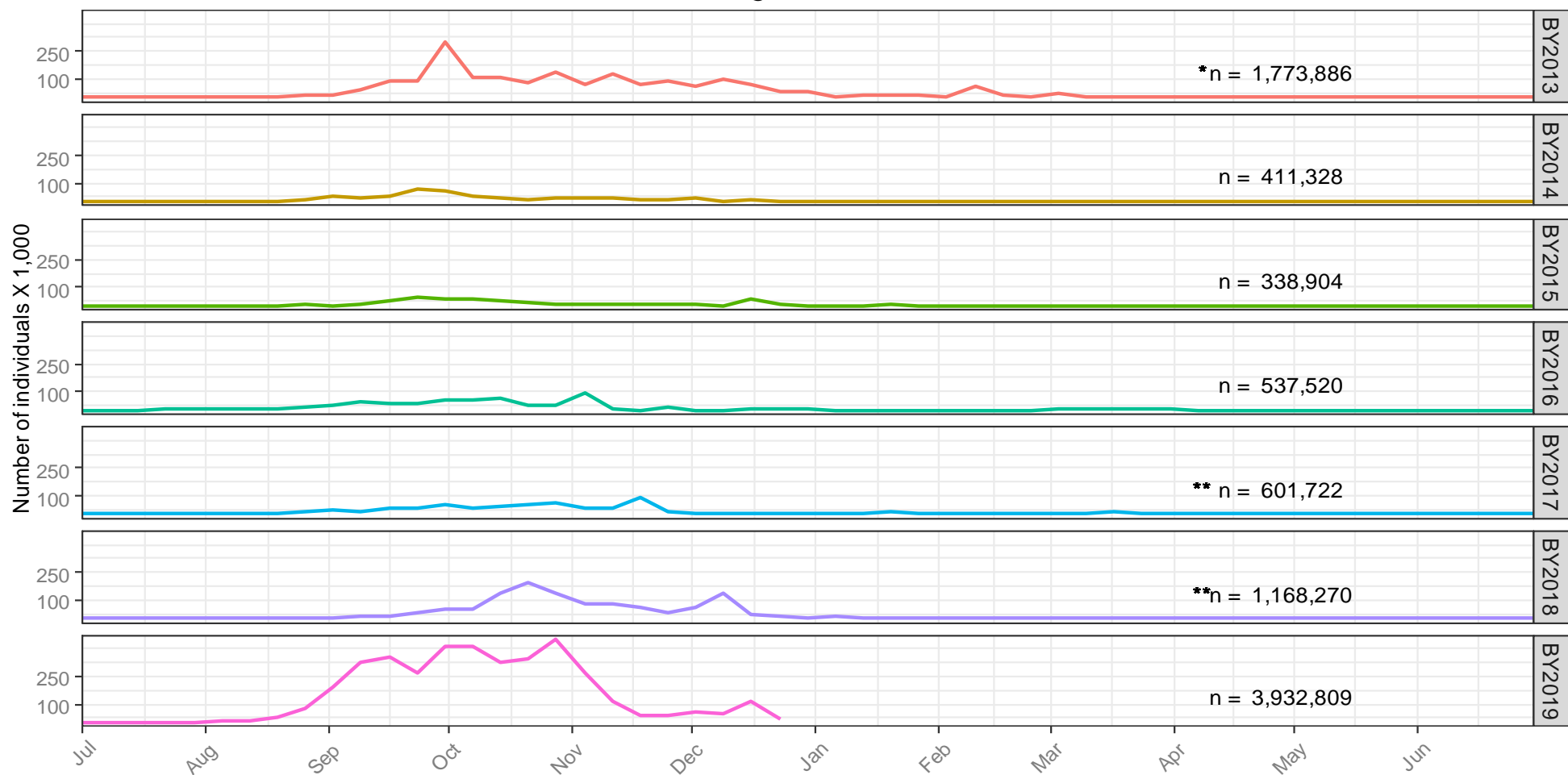


Figure 1. Weekly estimated passage of unmarked juvenile winter Chinook salmon at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period July 1, 2013 to present .

\*Winter Chinook passage value interpolated using a monthly mean for the period October 1, 2013 - October 17, 2013 due to government shutdown .

\*\*Winter Chinook passage value reflects addition of length-at-date spring Chinook determined to be winter Chinook from genetic analysis during the period of October 16th thru November 18th during brood years 2017 and 2018. See memos on 2018 biweekly report page for more info .

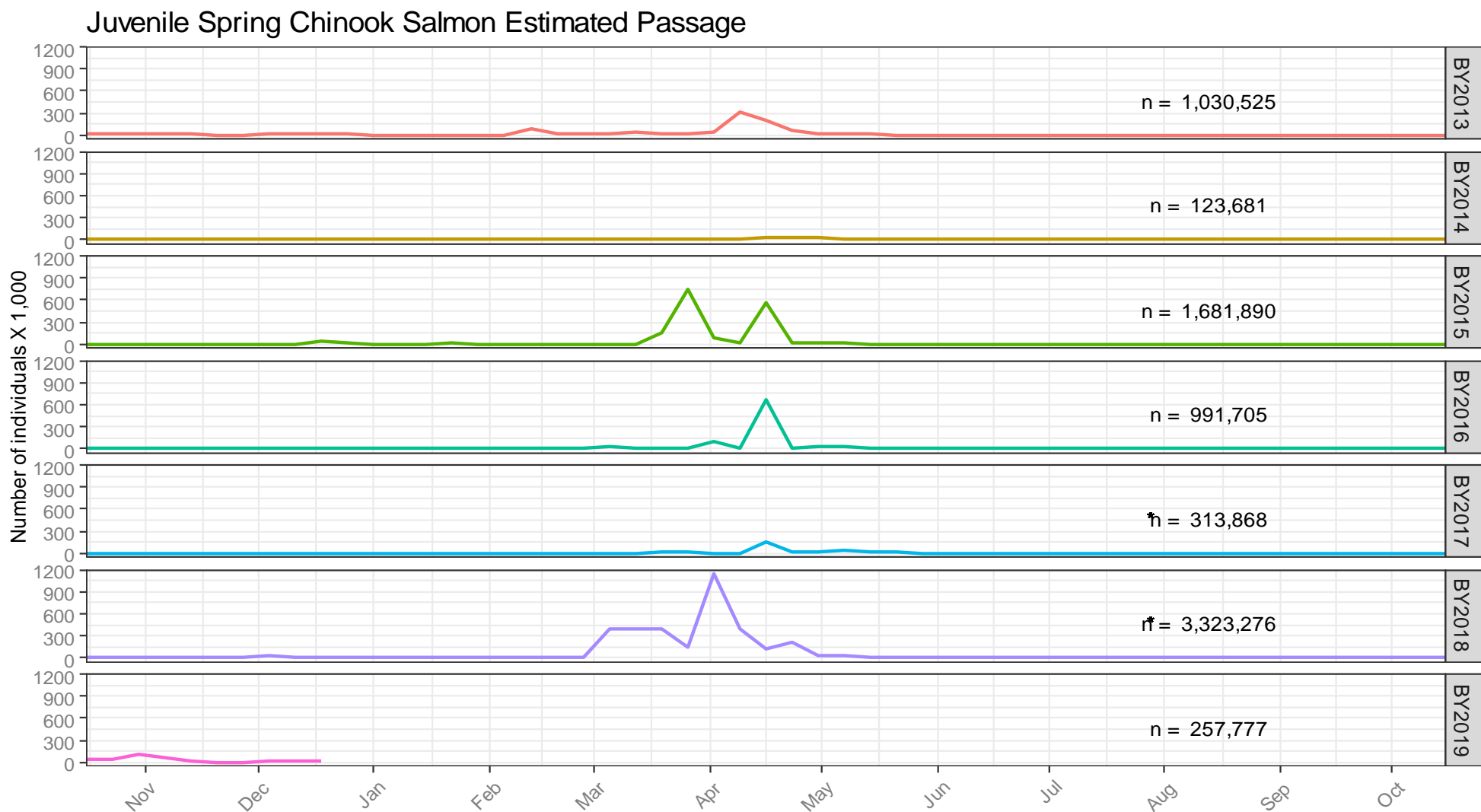


Figure 2. Weekly estimated passage of unmarked juvenile spring Chinook salmon at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period October 16, 2013 to present .

\*Spring Chinook passage value reflects subtraction of length-at-date spring Chinook determined to be winter Chinook from genetic analysis during the period of October 16th thru November 18th during brood years 2017 and 2018. See memos on biweekly report website for more info .

## Juvenile *Onchorhyncus mykiss* Estimated Passage

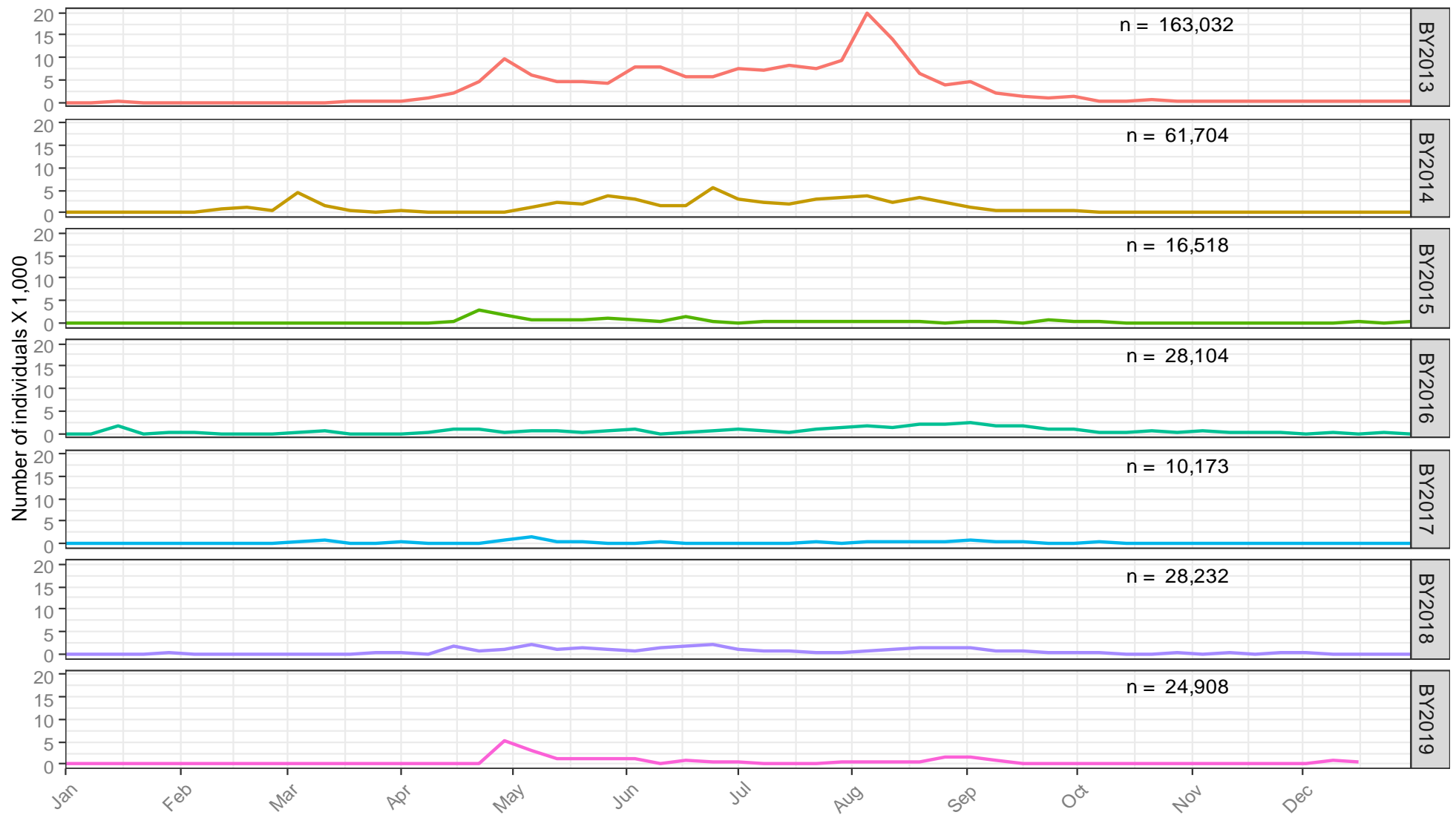


Figure 3. Weekly estimated passage of unmarked juvenile Rainbow/Steelhead trout at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period January 1, 2013 to present .

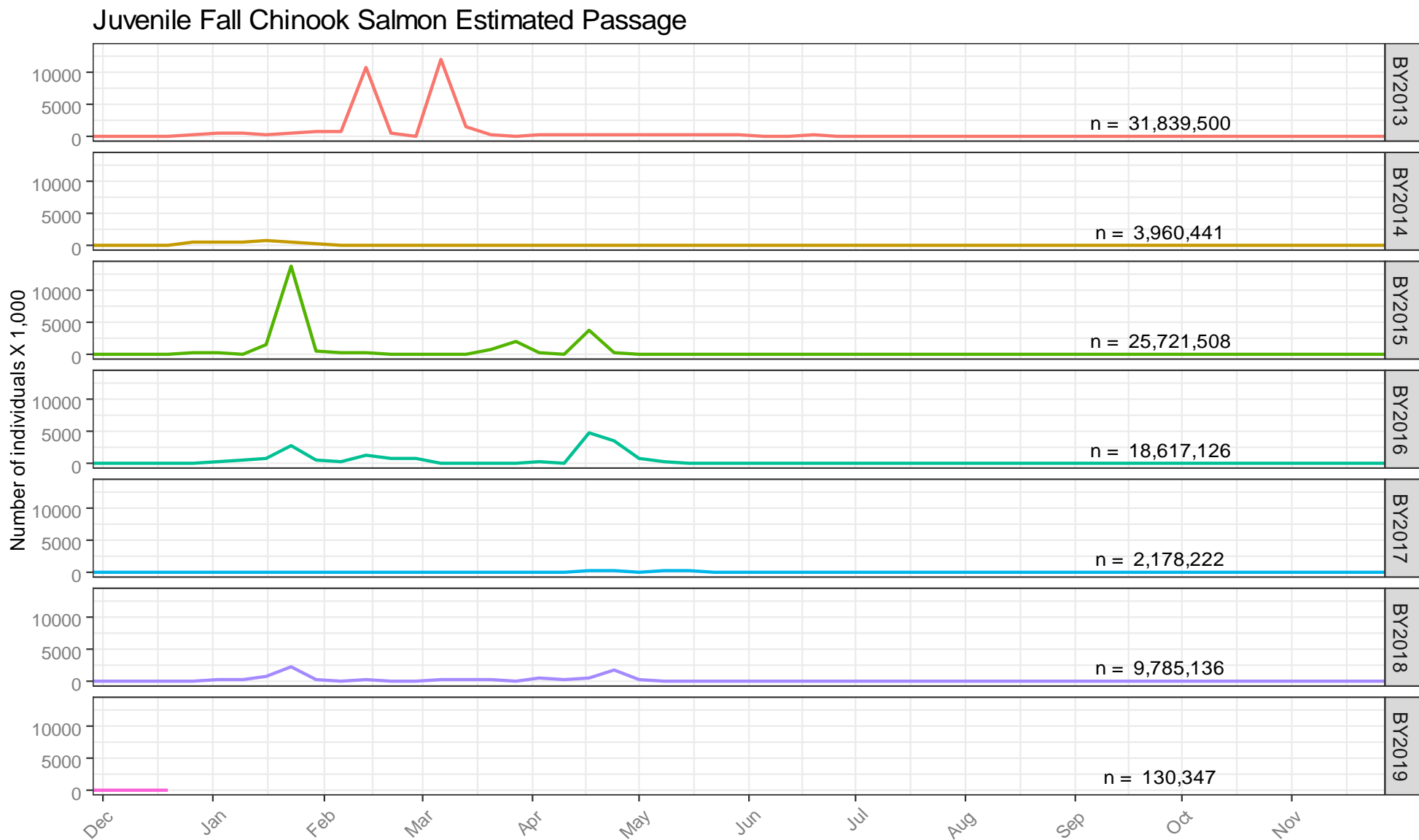


Figure 4. Weekly estimated passage of unmarked juvenile fall Chinook salmon at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period December 1, 2013 to present .

## Juvenile Late Fall Chinook Salmon Estimated Passage

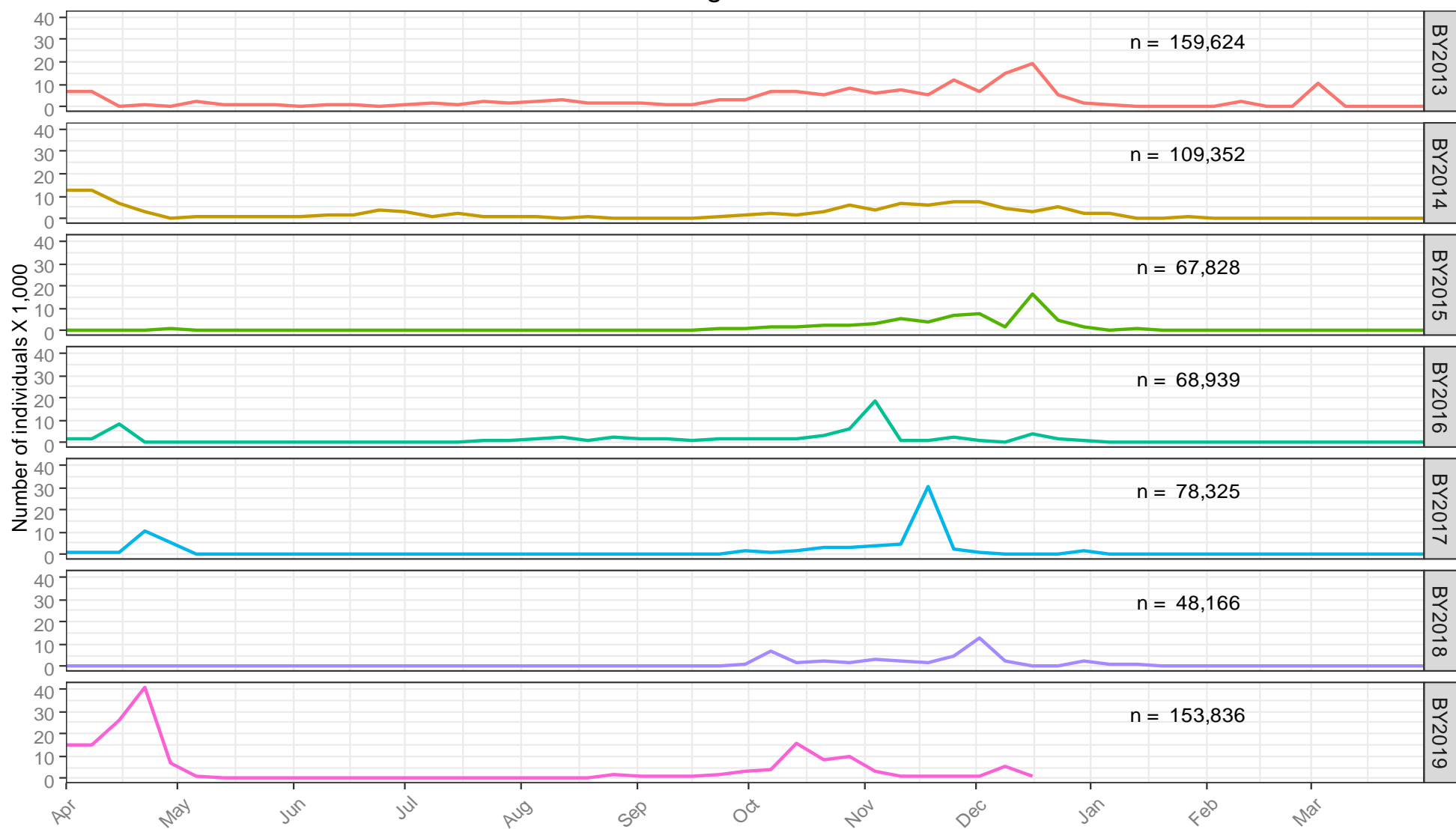


Figure 5. Weekly estimated passage of unmarked juvenile late fall Chinook salmon at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period April 1, 2013 to present .

## Weekly Estimated Chinook Passage at Red Bluff Diversion Dam - All Runs Combined

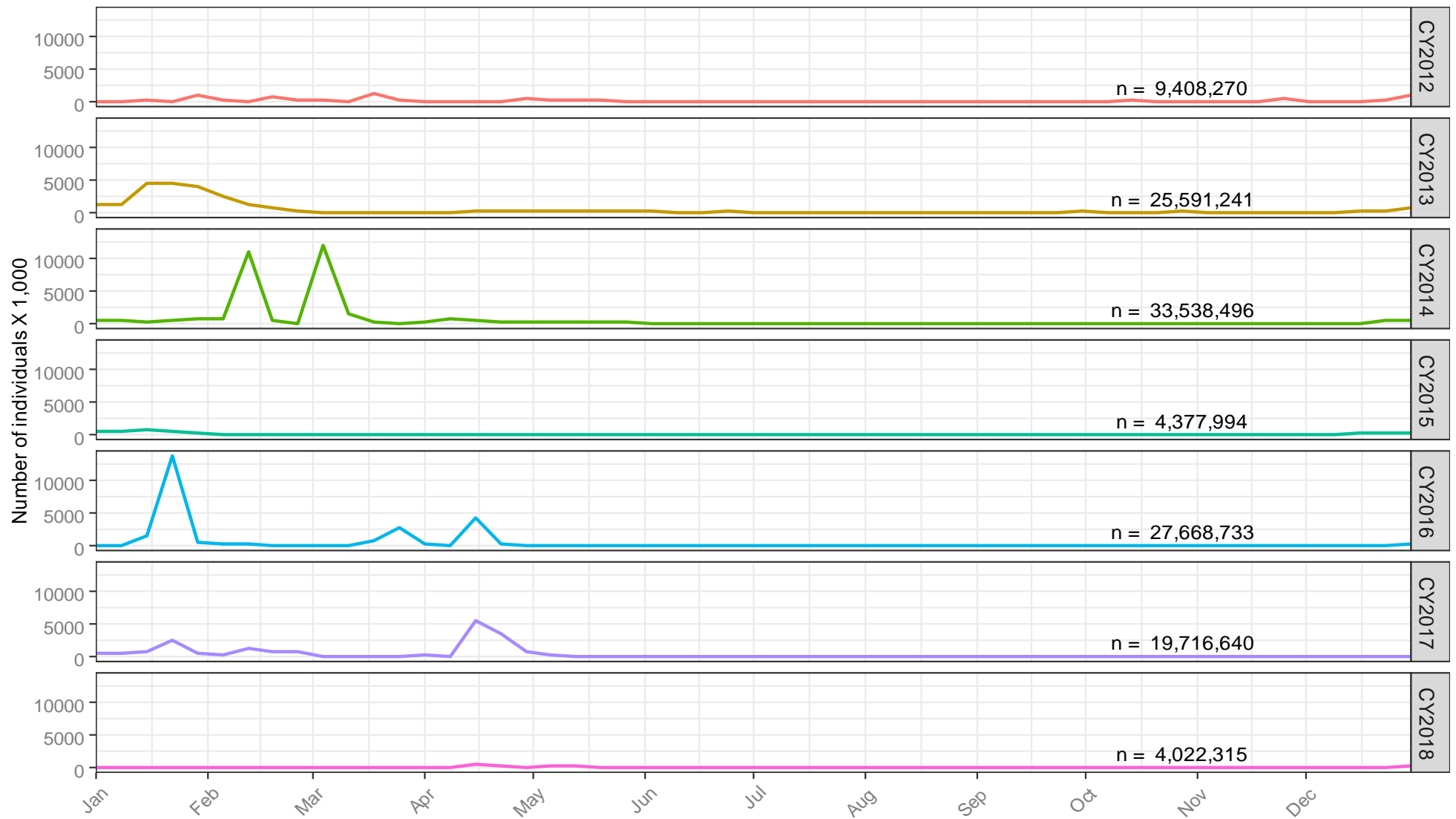


Figure 6. Weekly estimated passage of unmarked juvenile Chinook salmon at Red Bluff Diversion Dam (RK391) by calendar year. Fish were sampled using rotary-screw traps for the period January 1, 2012 to December 31, 2018